## Overview

HPE ProLiant XL190r Gen9 Server

The ProLiant XL190r Gen9 Server is a 2U half-width, 2 processor server with the same configuration options as the XL170r for CPU and memory, but has additional PCIe slots in multiple configurations providing support for additional expansion cards and future support for two (2) integrated accelerators per server (GPUs or Coprocessors).
This server leverages Intel's latest Xeon E5-2600 v3 and E5-2600 v4 series processors increasing performance up to 30-40%, and DDR4 HPE SmartMemory, at speeds of up to 2133 MHz and 512GB maximum which boosts bandwidth and efficiency up to 50% over previous generation servers.

The dense and flexible HPE Apollo 2000 Chassis can accommodates up to two 2U hot-swap server trays to meet workload needs while lowering TCO.

Rack scale power efficiency is fueled by the optional Advanced Power Management for rack, chassis, server and component level management

Front View
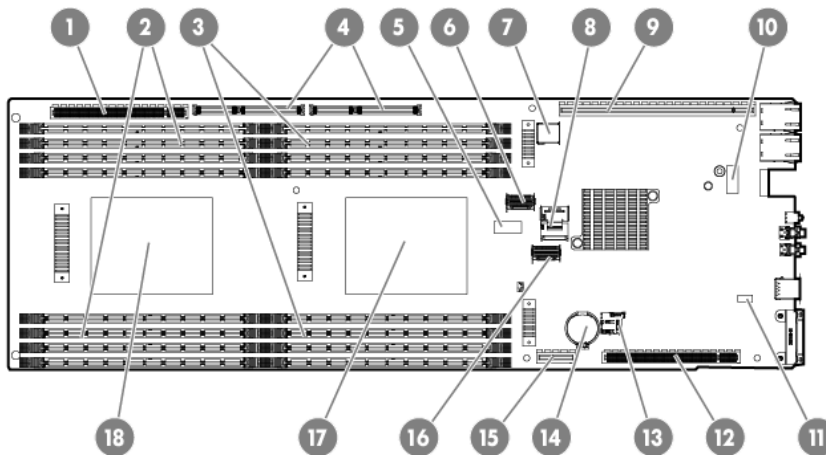
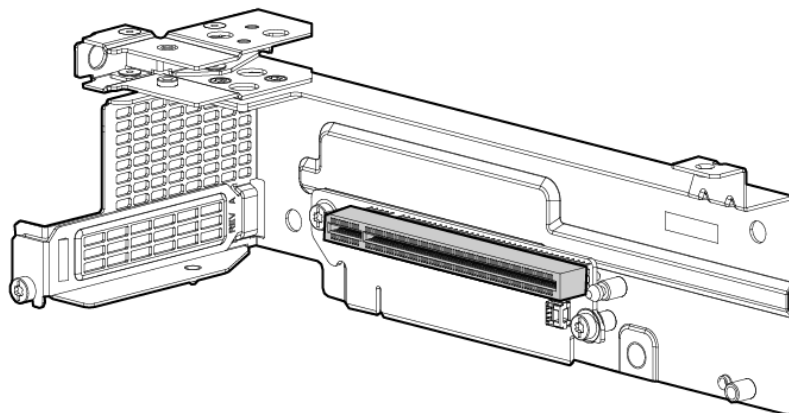| Item	Description	Item	Description
1	Bayonet board slot	10	Dedicated iLO port connector
2	DIMMs for processor 2	11	NMI header
3	DIMMs for processor 1	12	PCIe x16 riser board connector*
4	PCIe x40 riser board connector*	13	microSD slot
5	System maintenance switch	14	System battery
6	Mini-SAS connector 1 (SATA x4)	15	M.2 SSD riser connector
7	Internal USB 3.0 connector	16	TPM connector
8	Mini-SAS connector 2 (SATA x4)	17	Processor 1
9	PCIe x24 riser board connector*	18	Processor 2

Overview

2U Node Rear Panel Components
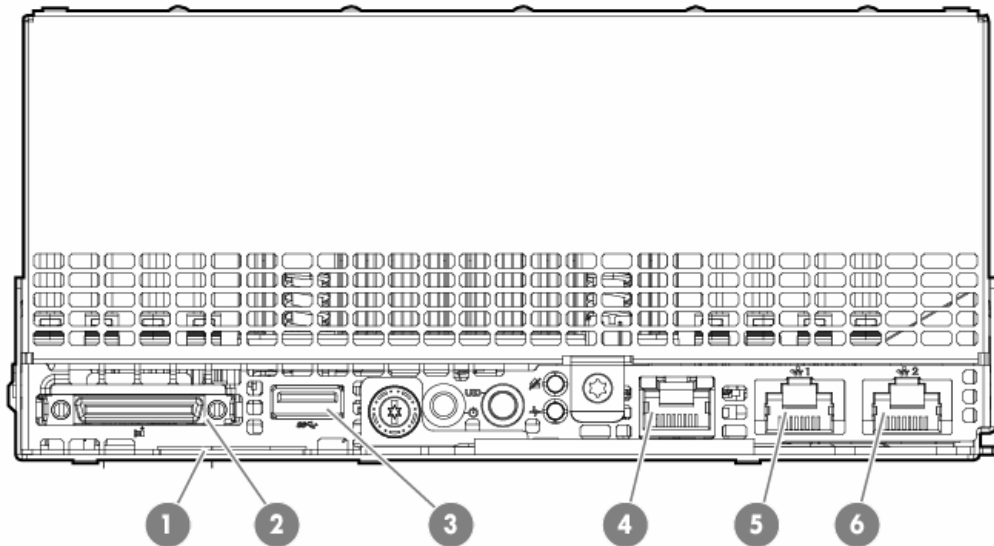
Item	Description	Item	Description
1	Node serial number and iLO label pull tab	4	Dedicated iLO port (optional)
2	SUV connector	5	NIC connector 1
3	USB 3.0 connector	6	NIC connector 2

Single-Slot 2U Node PCI Riser Cage Assembly

Item	Form factor	Slot number	Slot description
1	Low-profile PCIe card	1	PCIe3 x16 (16, 8, 4, 1) for Processor 1

Overview

FlexibleLOM 2U node riser cage assembly
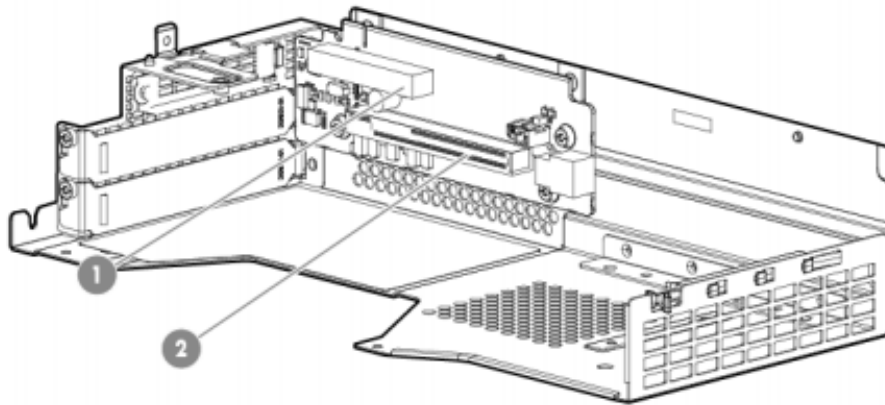
Item	Form factor	Slot number	Slot description
1	FlexibleLOM	FlexibleLOM slot	PCIe3 x8 for Processor 1
2	Storage controller or accelerator card	2	PCIe3 x16 (16, 8, 4, 1) for Processor 1

Three-slot GPU-direct PCI riser cage assembly
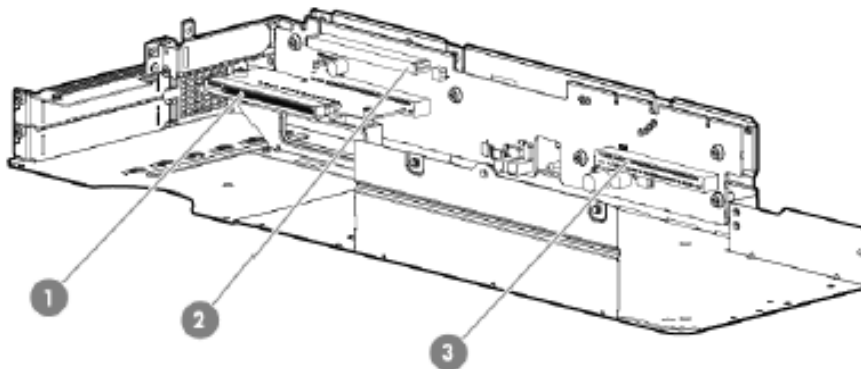
Item	Form factor	Slot number	Slot description
1	Storage controller or graphic card	3	PCIe3 x16 (16, 8, 4, 1) for Processor 1
2	Low-profile PCIe NIC card	2	PCIe3 x16 (16, 8, 4, 1) for Processor 2
3	Graphic card	4	PCIe3 x16 (16, 8, 4, 1) for Processor 2

Standard Features

NOTE: For the Standard Features shipped in the Factory Integrated Models, please see the "Configuration Information - Factory Integrated Models" section.

Processor
One of the following depending on Model

E5-2600 v3 series Processors

Model	CPU frequency	Cores	L3 Cache	Power	QPI	DDR4 MHz
E5-2699v3	2.3GHz	18	45MB	145W	9.6GT/s	2133
E5-2698v3	2.3GHz	16	40MB	135W	9.6GT/s	2133
E5-2697v3	2.6GHz	14	35MB	145W	9.6GT/s	2133
E5-2695v3	2.3GHz	14	35MB	120W	9.6GT/s	2133
E5-2690v3	2.6GHz	12	30MB	135W	9.6GT/s	2133
E5-2683v3	2.0GHz	14	35MB	120W	9.6GT/s	2133
E5-2680v3	2.5GHz	12	30MB	120W	9.6GT/s	2133
E5-2670v3	2.3GHz	12	30MB	120W	9.6GT/s	2133
E5-2667v3	3.2GHz	8	20MB	135W	9.6GT/s	2133
E5-2660v3	2.6GHz	10	25MB	105W	9.6GT/s	2133
E5-2650v3	2.3GHz	10	25MB	105W	9.6GT/s	2133
E5-2650Lv3	1.8GHz	12	25MB	65W	9.6GT/s	2133
E5-2643v3	3.4GHz	6	20MB	135W	9.6GT/s	2133
E5-2640v3	2.6GHz	8	20MB	90W	8.0GT/s	1866
E5-2637v3	3.5GHz	4	15MB	135W	9.6GT/s	2133
E5-2630v3	2.4Ghz	8	20MB	85W	8.0GT/s	1866
E5-2630Lv3	1.8GHz	8	25MB	55W	8.0GT/s	1866
E5-2620v3	2.4GHz	6	15MB	85W	8.0GT/s	1866
E5-2609v3	1.9GHz	6	15MB	85W	8.0GT/s	1600
E5-2603v3	1.6GHz	6	15MB	85W	6.4GT/s	1600

Processor
One of the following depending on Model

E5-2600 v4 series Processors (Please follow product offering to fill out processor SKU)

Model	CPU frequency	Cores	L3 Cache	Power	QPI	DDR4 Hz
E5-2603v4	1.7GHz	6	15MB	85W	9.6GT/s	1866
E5-2609v4	1.7GHz	8	20MB	85W	9.6GT/s	1866
E5-2620v4	2.1GHz	8	20MB	85W	9.6GT/s	2133
E5-2623v4	2.6GHz	4	10MB	85W	9.6GT/s	2133
E5-2630Lv4	1.8GHz	10	25MB	55W	9.6GT/s	2133
E5-2630V4	2.2GHz	10	20MB	85W	9.6GT/s	2133
E5-2637V4	3.5HGz	4	15MB	135W	9.6GT/s	2133
E5-2640V4	2.4GHz	10	25MB	90W	9.6GT/s	2400
E5-2643V4	3.4GHz	6	20MB	135W	9.6GT/s	2400
E5-2650LV4	1.7GHz	14	35MB	65W	9.6GT/s	2400
E5-2650V4	2.2GHz	12	30MB	105W	9.6GT/s	2400
E5-2660V4	2.0GHz	14	35MB	105W	9.6GT/s	2400

Standard Features

E5-2667V4	3.2GHz	8	25MB	135W	9.6GT/s	2400
E5-2680V4	2.4GHz	14	35MB	120W	9.6GT/s	2400
E5-2683V4	2.1GHz	16	40MB	120W	9.6GT/s	2400
E5-2690V4	2.6GHz	14	35MB	135W	9.6GT/s	2400
E5-2695V4	2.1GHz	18	45MB	120W	9.6GT/s	2400
E5-2697V4	2.3GHz	18	45MB	145W	9.6GT/s	2400
E5-2698V4	2.2GHz	20	50MB	135W	9.6GT/s	2400
E5-2697AV4	2.3GHz	16	40MB	145W	9.6GT/s	2400
E5-2699V4	2.2GHz	22	55MB	145W	9.6GT/s	2400

Processor
One of the following depending on Model

E5-1600 v3 series Processors (Please follow product offering to fill out processor SKU)

Model	CPU frequency	Cores	L3 Cache	Power	DDR4 Hz
E5-1680v3	3.2GHz	8	20MB	140W	2133
E5-1650v3	3.5GHz	6	15MB	140W	2133
E5-1630v3	3.7GHz	4	10MB	140W	2133

NOTE: : these processors are supported with the following risers kits.
- HPE XL170r FLOM x8 R Riser Kit-798180-B21
- HPE XL170r/190r LP PCIex16 L Riser Kit- 798178-B21
- HPE XL170r Gen9 LP PCIex16 R Riser Kit-819939-B21

Chipset

Intel® C610 Series Chipset

NOTE: For more information regarding Intel® chipsets, please see the following URL:
http://www.intel.com/products/server/chipsets/

On System Management Processor

HPE iLO (Firmware: HPE iLO 4)

NOTE: For more information, visit: **http://www.hp.com/go/ilo**

Memory Protection

Advanced ECC (multi-bit error protection)
Memory Online Spare Mode (Rank Spare Mode)

Memory

Type	HPE SmartMemory
	DDR4 Load Reduced (LRDIMM), or Registered (RDIMM)
DIMM Slots Available	16 DIMM Slots available
Maximum (LRDIMM) (per server tray)	512GB (16 x 32GB)

NOTE: HPE memory from previous generation servers are not fully compatible with the HPE ProLiant XL190r Gen9 Server.
NOTE: To realize the performance memory capabilities listed in this document, HPE SmartMemory isrequired. For additional information, please see the HPE SmartMemory QuickSpecs at: **https://www.hpe.com/h20195/v2/gethtml.aspx?docname=c04111535**
NOTE: LRDIMM and RDIMM are distinct memory technologies and cannot be mixed within a server.
NOTE: Depending on the memory configuration and processor model, the memory speed may run at 2400MHz, 2133MHz, 1866MHz, or 1600MHz. Please see Memory Population Table or the Online Memory Configuration Tool at: **http://h22195.www2.hpe.com/MemoryTool/Home/Legal**

Network Controller   **Ethernet Options**

Standard Features

HPE Ethernet 1Gb 2P 332T Adptr
HPE Ethernet 1Gb 4-port 331T Adapter
HPE Ethernet 1Gb 2P 361T Adptr
HPE Ethernet 10Gb 2P 530SFP+ Adptr
HPE Ethernet 10Gb 2P 530T Adptr
HPE Ethernet 10Gb 2P 560SFP+ Adptr
HPE Ethernet 10Gb 2P 561T Adptr
HPE Ethernet 10Gb 2P 561FLR-T Adptr
HPE Ethernet 10G 2-port 546SFP+ Adptr
HPE 1Gb Ethernet 4P 331FLR Adptr
HPE Ethernet 1Gb 4-port 366FLR Adapter
HPE Ethernet 10Gb 2P 560FLR-SFP+ Adptr
HPE FlexFabric 10Gb 2P 534FLR-SFP+ Adptr
HPE FlexFabric 10Gb 2P 533FLR-T Adptr
HPE FlexFabric 10Gb 2P 556FLR-SFP+ Adptr
HPE FlexFabric 10Gb 4-port 536FLR-T Adapter
HPE FlexFabric 10Gb 2-port 536FLR-T Adapter
HPE Ethernet 10Gb 2P 546FLR-SFP+ Adptr
HPE Ethernet 10Gb 2-port 562SFP+ Adptr
HPE Ethernet 10Gb 2-port 562FLR-SFP+ Adpt
HPE StoreFabric CN1200E-T 10Gb CAN
HPE StoreFabric CN1100R-T 10Gb CNA
InfiniBand Options
HPE IB FDR/EN 40Gb 2P 544+FLR-QSFP Adptr
HPE IB QDR/EN 10Gb 2P 544+FLR-QSFP Adptr
HPE IB FDR/EN 40Gb 2P 544+QSFP Adptr
HPE IB FDR 2P 545FLR-QSFP Adptr
HPE IB FDR 2P 545QSFP Adptr
QLogic 4X QDR IB PCI-e G2 HCA
HPE IB EDR/EN 100Gb 1P 840QSFP28 Adptr
HPE IB EDR/EN 100Gb 2P 840QSFP28 Adptr
HPE 100Gb 1p OP101 QSFP28 x16 OPA Adptr
Riser Options to support FlexibleLOM cards
 HPE XL190r Gen9 LPx16 FLOMx8 R Riser Kit
NOTE: The HPE XL190r Gen9 LPx16 FLOMx8 R Riser Kit (798184-B21) is required to order the FlexibleLOM options. Max operating temp is 23C ambient

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HPE Server ROM　　　　**NOTE:** indicates the number of physical electrical lanes running to the connector.
　　　　　　　　　　　　　　* FHFLDW allows for cards up to 10.5" in Length

HPE ROM (Read Only Memory) is now digitally signed using the HPE Corporate Signing Service. This signature is verified before the flash process starts, reducing accidental programming and preventing malicious efforts to corrupt system ROM.

HPE ROM provides for essential initialization and validation of hardware components before control is passed to the customer-installed operating system. The ROM also provides the capability of booting from various fixed media (HDD, CD-ROM) and removable media (USB), to continue operation to the operating system.

HPE ROM performs very early configuration of the video controller, to allow monitoring of initialization progress via an attached monitor. If configuration or hardware errors are discovered during this early phase of hardware initialization, suitable messages are now displayed on the connected monitor. Additionally, these configuration or hardware errors are logged to the Integrated Management Log (IML) to assist in diagnosis.

Standard Features

The HPE ProLiant ROM is used to configure the following:

- Processor and chipset status registers
- System memory, memory map, and memory initialization
- System hardware configuration (Integrated PCI devices and optional PCIe cards).
- Customer-specific BIOS configuration (using the HPE ROM-Based Setup Utility (RBSU).

NOTE: For further information, please refer to the HPE RBSU (ROM based setup utility) user guide: **http://www.hp.com/support/rbsu.**

HPE Server Unified Extensible Firmware Interface (UEFI) or Legacy Mode

The HPE ProLiant System BIOS is an EDK2 UEFI solution, and adheres to the latest revisions of UEFI Class 2 specifications which supports both legacy boot and UEFI boot operation. The HPE ProLiant XL190r Gen9 defaults to UEFI boot operation and can be factory or field configured for Legacy boot operation.
NOTE: For UEFI boot operation, boot environment and OS image installations should be configured properly to support UEFI.
NOTE: For more information on Hewlett Packard Enterprise's ProLiant System BIOS and UEFI, see the UEFI Information Library: **http://www.hp.com/go/uefi/docs**
NOTE: HPE Legacy FIO Mode Setting (758959-B22) can be selected to configure the system in UEFI mode in the factory.

To modify the server configuration ROM default settings, press F9 in the HPE ProLiant POST screen to enter the UEFI System Utilities screen. By default, the System Utilities menus are in the English language.

UEFI enables numerous new capabilities, including both industry standard functionality and features specific to HPE ProLiant servers. Following are some of the features that UEFI enables and that the HPE ProLiant XL190r Gen9 can support when configured for UEFI boot operation:
- Secure Boot - A new feature in which the system firmware, option card firmware, operating systems, and software collaborate to greatly enhance platform security.
- Operating system specific functionality - Microsoft Windows 2012 supports several features only when installed in UEFI mode.
- Support for > 2.2 TB (using GPT) boot drives - Such drives could previously only be used for boot drives when using RAID solutions such as HPE Smart Array.
- UEFI Shell - Provides a pre-boot environment for running scripts and tools. The HPE ProLiant UEFI Shell provides both standard capabilities as well as numerous enhancements.
- PXE boot support for IPv6 networks.
- PXE Multicast Boot allowing for faster PXE deployments for large numbers of servers.
- Boot support for option cards that only support a UEFI option ROM.

NOTE:
- When the server is configured for UEFI Boot Mode, PXE servers must be configured with a UEFI boot image.
- When the server boots in UEFI mode, it does not boot media with a legacy OS installation. This includes DOS targets and Windows or Linux systems installed in Legacy mode. The reverse is also true for servers that boot in Legacy mode.
- If Microsoft Windows 2008 or Windows 2008 R2 is used in UEFI Boot Mode, UEFI Optimized Mode must be disabled (this option is enabled by default). This is required to work around an issue in Windows 2008 / 2008 R2 that requires legacy BIOS components necessary for video operations in Windows.

Storage Controller

Smart Array Controller
HPE Dynamic Smart Array B140i Controller

Standard Features

HPE Smart Array P440/4G Controller
HPE Smart Array P441/4G Controller
HPE Smart Array P840/4G Controller
HPE Smart Array P841/4G Controller
Host Bus Adapter
HPE H240 Host Bus Adapter
HPE H241 Smart HBA
Storage Controller Cable Kits
HPE XL190r B140i Cbl FIO Kit
HPE XL190r Gen9 Mini-SAS H240 Cbl Kit
HPE XL190r Gen9 Mini-SAS P440 Cbl Kit
HPE XL1x0r Gen9 Mini-SAS P840/440 Cbl Kit
NOTE: The H240 controller and the embedded B140i will operate in UEFI mode only. For legacy support, AHCI mode is required.

Internal Storage Devices Internal MicroSD slot

Maximum Internal Storage			
	Hot Plug LFF SAS 10k	24TB	x 6TB
	Hot Plug LFF SATA	4.0TB	6 x 1TB
	Hot Plug LFF SATA SSD	1.9 TB	6 x 480GB
	Hot Plug LFF SAS SSD	19.2TB	12 X 1.6TB
	Hot Plug SFF SAS 7.2k	12TB	12 X 1.0TB
	Hot Plug SFF SAS 10k	21.6TB	12X1.8TB
	Hot Plug SFF SAS 15k	7.2TB	12X600GB
	Hot Plug SFF SATA	12TB	12X1TB
	Hot Plug SFF SATA SSD	11.5TB	12X960GB
	Hot Plug SFF SAS SSD	19.2TB	12X1.6TB

Interfaces		
	FlexibleLOM	HPE ProLiant Gen9 servers offer a new networking technology-Flexible Network Technology. The HPE ProLiant Gen9 server offers the customer the choice of 1Gigabit, 10Gigabit, InfiniBand or FlexibleLOM solutions depending on workload. For further details on the choices, see FlexibleLOM in the Networking Section of this document.
	KVM	Serial USB Video Port (SUV)
	MicroSD	1 (internal)
	USB Ports	2 (external via SUV) 1 (USB 3.0 internal)
	HPE iLO Remote Management Network Port	Aggregated via HPE Apollo 2000 Chassis
	Health LED	1
	Power	1
	UID	1
	Do not remove LED	1
Industry Standard Compliance	ACPI 2.0b Compliant	
	PCIe 3.0 Compliant	
	WOL Support	
	Microsoft® Logo certifications	

Standard Features

PXE Support

USB 1.1 and 2.0 Compliant

SMBIOS 2.6.1

Power Ratings   To review typical system power ratings use the HPE Power Advisor which is available via the online tool located at URL: **http://www.hp.com/go/proliant-energy-efficient** or **http://www.hp.com/go/hppoweradvisor.**
NOTE: Power Specification and Technical Content for supported power supplies can be found at: **https://www.hpe.com/h20195/v2/gethtml.aspx?docname=c04111541**

Operating Systems and Virtualization Software Support for ProLiant Servers   Microsoft Windows Server
Red Hat Enterprise Linux (RHEL)
SUSE Linux Enterprise Server (SLES)
Canonical Ubuntu
VMware
NOTE: Only 64-bit versions of these operating systems are supported.
NOTE: For more information on the Hewlett Packard Enterprise Certified and Supported ProLiant Servers for OS and Virtualization Software and more OS support timeline such as Debian, CentOS, Fedora, OpenSUSE and Asianux, please visit our OS support site at **http://www.hp.com/go/ossupport** and our driver download page: **http://www.hp.com/support.**

Graphics   Integrated Matrox G200 video standard
- 1280 x 1024 (32 bpp)
- 1920 x 1200 (16 bpp)

HPE iLO 4 On System Management Memory
- 16 MB Flash
- 256 MB DDR 3 with ECC (112 MB after ECC and video)

Form Factor   The ProLiant XL190r Gen9 Server is a single-slot 2U tray for the HPE Apollo 2000 Chassis.

Embedded Management   HPE Integrated Lights Out   Monitor your servers for ongoing management, service alerting, reporting and remote management with iLO. Learn more at **http://www.hp.com/go/ilo**.

UEFI   Configure and boot your servers securely with industry standard Unified Extensible Firmware Interface (UEFI). Learn more at **http://www.hp.com/go/ProLiant/uefi.**

HPE RESTful API   RESTful API is an application programming interface. RESTful Web Service API served by iLO's web server.**http://www.hp.com/go/restfulapi.**

Intelligent Provisioning   Provision servers by discovering and deploying 1 to few servers with Intelligent Provisioning. Learn more at **http://www.hp.com/go/intelligentprovisioning.**

Server Utilities   HPE Smart Update   Optimize firmware and driver updates with HPE Smart Update solutions. Learn more at **http://www.hp.com/go/smartupdate.**

HPE Systems Insight Manager (HPE SIM)   HPE SIM allows you to monitor the health of your HPE ProLiant Servers and HPE Integrity Servers, and also provides you with basic support for non-Hewlett Packard Enterprise servers. HPE SIM also integrates with HPE SUM to provide quick and seamless firmware updates. Learn more at **http://www.hp.com/go/sim**

Scripting Tool Kit and Windows PowerShell   Provision 1 to many servers using your own scripts to discover and deploy them with HPE Scripting Tool Kit for Windows and Linux or HPE Scripting

Standard Features

		Tools for Windows PowerShell. Learn more at **http://www.hp.com/go/ProLiantSTK** or **http://www.hp.com/go/powershell.**
	HPE RESTful Interface Tool	HPE RESTful API tool is a scripting tool to provision servers using RESTful API Interface to discover and deploy servers at scale. Learn more at **http://www.hp.com/go/restfulapi**
	HPE iLO Mobile Application	Enables the ability to access, deploy, and manage your server anytime from anywhere from select smartphones and mobile devices. For additional information please visit: **http://www.hp.com/go/ilo/mobileapp**
	HPE Insight Online	HPE Insight Online, available at no additional cost as part of your Hewlett Packard Enterprise warranty, Care Pack or contractual support agreement with Hewlett Packard Enterprise, is a personalized dashboard for simplified tracking of IT operations and support information from anywhere, anytime. Learn more at **http://www.hp.com/go/insightonline/info.**
Embedded Management	HPE Integrated Lights Out	Monitor your servers for ongoing management, service alerting, reporting and remote management with iLO. Learn more at **http://www.hp.com/go/ilo**.
HPE Insight management software	HPE Service Pack for ProLiant (SPP)	HPE Service Pack for ProLiant (SPP) and HPE Smart Update Manager (HPE SUM) provide a comprehensive approach to firmware and system software maintenance. Together they provide better operating stability and ensure maximum uptime. The SPP will be updated at a predictable cadence, typically coinciding with new Hewlett Packard Enterprise server hardware launches. By enabling firmware to be updated online and integrating firmware and system software updates in one operation, HPE SUM and the SPP offer faster updates of individual servers and dramatically faster updates of entire HPE Apollo 2000 Chassis. Further improving system uptime and stability is the fact that Hewlett Packard Enterprise provides 12 months of support for each Service Pack for ProLiant release (may vary by region).
		The user experience around HPE SUM and the SPP has been improved in several ways, starting with the web download. A single web page provides access to a single download containing both the latest version of HPE SUM and the latest SPP. Optional smaller subsets with only specific types of servers or specific operating systems are offered to save on download time. The HPE SUM application provides a straightforward, intuitive user interface that guides the user through the steps of discovery, analyses and update, providing comprehensive information on available updates, criticality and interdependencies. This information is also available in reports. By providing the option of multiple local or shared repositories which can be easily updated from hp.com, HPE SUM provides the tools to optimize stability and consistency throughout the company. While HPE SUM and the SPP recommend the combinations of firmware and system software that Hewlett Packard Enterprise has found to be the best practice, the application gives customers the flexibility to set their own specific baseline.
		The Service Pack for ProLiant has been rigorously tested with specific attention for interaction between firmware, drivers and agents both within the server as well as in interaction with the HPE Apollo 2000 chassis. This testing ensures the highest quality as well as providing the input for HPE SUM to deploy updates taking into account all interdependencies, when determining the correct updates and order of update deployment.

Standard Features

Security	Power-on password
	Keyboard password
	Serial interface control
	Administrator's password
	iLO 4 (Integrated Lights-Out 4) has 12 customizable user accounts and SSL encryption
	iLO 4 can be disabled via a Global Setting
	iLO Advanced supports directory services integration
	TPM (Trusted Platform Module) 2.0 option
Warranty	This product is covered by a global limited warranty and supported by Hewlett Packard Enterprise Services and a worldwide network of Hewlett Packard Enterprise Authorized Channel Partners (may vary by region). Hardware diagnostic support and repair is available for one year from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HPE Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty.

NOTE: Server Warranty includes 1 year Parts, 1 year Labor, 1-year on-site support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have Hewlett Packard Enterprise replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at:
http://h18004.www1.hpe.com/products/servers/platforms/warranty/index.html
http://www.hp.com/go/insightcontrol
NOTE: In Asia Pacific, Japan and China, Server Warranty includes 3 years Parts, 3 year Labor, 3-year Onsite support with next business day response

Optional Features

HPE Insight management software	HPE Insight Control	HPE Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. For more information, see: **http://www.hp.com/go/insightcontrol** HPE Insight Control includes one year of 24 x 7 HPE Software Technical Support and Update Service ensuring rapid access to Hewlett Packard Enterprise support staff and proactive delivery of software updates. For more information about this service, see: **http://www.hpe.com/services/insight**.
	HPE iLO Advanced	HPE Integrated Lights-Out Advanced License a product option, providing smart remote server management without compromise. iLO Advanced unlocks the full set of remote administration functionality for all HPE ProLiant servers by activating the full Virtual Keyboard Video and Mouse remote console, multi-user collaboration, console record and replay, GUI-based and scripted virtual media and virtual folders, and enhanced security and power management functionality. For more information, see: **http://www.hp.com/go/iloadvance**
	HPE iLO Scale-Out	The HPE iLO Scale-Out license ideal for web/hosting/cloud service providers and High Performance Computing environments. This license is a specific subset of iLO Advanced functionality, provides fast remote access through Text Console via SSH, lower operational cost with Dynamic power capping, and faster time to resolution through Email-based Alerting and proactive notifications. With this newly designed HPE iLO Scale-Out license HPC customers now have a server management package solely design and priced for their massive data environments. HPE iLO Scale-Out is available on all HPE ProLiant Gen9 servers. For more information, see: **http://www.hp.com/go/iLO/scale-out**
	HPE Matrix Operating Environment	The HPE Matrix Operating Environment (Matrix OE) for ProLiant and Integrity servers is an integrated command center that helps you instantly adjust to dynamic business demands. This advanced infrastructure management software lets you reduce the cost of common data center tasks by up to 40 percent while keeping pace with your changing business. The HPE Matrix OE includes the automated provisioning, optimization, and recovery management capabilities for HPE CloudSystem Matrix, the ideal platform for private cloud and Infrastructure as a Service (IaaS). **NOTE:** For more information, visit: **http://www.hp.com/go/matrixoe**
High Performance Clusters	HPE Cluster Platforms	HPE Cluster Platforms are specifically engineered, factory-integrated large-scale ProLiant clusters optimized for High Performance Computing, with a choice of servers, networks and software. Operating system options include specially priced offerings for Red Hat Enterprise Linux and SUSE Linux Enterprise Server, as well as Microsoft Windows HPC Server. A Cluster Platform Configurator simplifies ordering. **http://www.hp.com/go/clusters**
	HPE HPC Interconnects	High Performance Computing (HPC) interconnect technologies are available for this server as part of the HPE Cluster Platform portfolio. These high-speed InfiniBand and Gigabit interconnects are fully supported by Hewlett Packard Enterprise when integrated within an Hewlett Packard Enterprise cluster. Flexible, validated solutions can be defined with the help of configuration tools. **http://www.hpe.com/techservers/clusters/ucp/index.html**

Optional Features

	HPE Insight Cluster Management Utility	HPE Insight Cluster Management Utility (CMU) is an Hewlett Packard Enterprise-licenced and Hewlett Packard Enterprise-supported suite of tools that are used for lifecycle management of hyperscale clusters of Linux ProLiant systems. CMU includes software for the centralized provisioning, management and monitoring of nodes. CMU makes the administration of clusters user friendly, efficient, and effective. **http://www.hp.com/go/cmu**
HPE Insight Online		HPE Insight Online is a new addition to the HPE Support Center for one stop, secure access to product and Hewlett Packard Enterprise support information personalized to your IT environment. Insight Online can automatically display devices remotely monitored by HPE Insight Remote Support. With Insight Online's easy navigation you can efficiently track your IT support contracts and device status from anywhere and at any time. **http://www.hp.com/go/insightonline**

Service and Support

Service and Support   The support Care Packs chosen for the chassis are applied to this server node at no additional cost.

HPE Technology Services for HPE Apollo 2000
HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to Hewlett Packard Enterprise to help prevent problems and solve issues faster. Our support technology lets you to tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, any time.

Support for the HPE Apollo 2000, APM and chassis are all covered by support purchased at the chassis level. This simplifies your support experience and can reduce total cost of ownership over support purchased per server.

What HPE Technology Services can do for you
We can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. Our services solutions include more than just uplift of base warranty; we help deliver high levels of application availability through proactive service management and advanced technical response.

Protect your business beyond warranty with HPE Care Pack Services that provide total support expertise to meet your IT and business needs. We have made it simple to select among 3 levels of recommended services; optimized, standard, or basic.

For more information   To learn more on HPE ProLiant servers, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Or visit:
http://www.hpe.com/services/proliant

To find the full list of Care Pack SKUs for the HPE Apollo family of products, go to:
http://hp.com/go/lookuptool and in step 2 select HPE ProLiant, then select HPE Apollo family.

Configuration Information – Factory Integrated Models

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, Hewlett Packard Enterprise recommends the use of an Hewlett Packard Enterprise approved configurator. Contact your local sales representative for information on configurable product offerings and requirements.
NOTE: FIO indicates that this option is only available as a factory installable option.
NOTE: HPE Apollo 2000 Chassis is required to support the server. Refer to their QuickSpecs for additional information.
HPE Apollo 2000Chassis

Step 1: Base Configuration (Choose one of the CTO Models below)

HPE CTO Model   HPE ProLiant XL190r Gen9 2U Node Configure-to-order Server   798156-B21

Step 2: Choose Required Options (only one from each category unless otherwise noted)

HPE XL1x0r Gen9 Intel® Xeon® E5-2603v3 (1.6GHz/6-core/15MB/85W) FIO Processor Kit	793012-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2609v3 (1.9GHz/6-core/15MB/85W) FIO Processor Kit	793014-L21
HPE XL1x0R Gen9 Intel® Xeon® E5-2620v3 (2.4GHz/6-core/15MB/85W) FIO Processor Kit	793016-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2630v3 (2.4GHz/8-core/20MB/85W) FIO Processor Kit	793018-L21
HPE XL1x0 Gen9 Intel® Xeon® E5-2695v3 (2.3GHz/14-core/35MB/120W) FIO Processor Kit	793048-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2640v3 (2.6GHz/8-core/20MB/90W) FIO Processor Kit	793020-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2650v3 (2.3GHz/10-core/25MB/105W) FIO Processor Kit	793022-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2660v3 (2.6GHz/10-core/25MB/105W) FIO Processor Kit	793024-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2670v3 (2.3GHz/12-core/30MB/120W) FIO Processor Kit	793026-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2680v3 (2.5GHz/12-core/30MB/120W) FIO Processor Kit	793028-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2690v3 (2.6GHz/12-core/30MB/135W) FIO Processor Kit	793030-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2697v3 (2.6GHz/14-core/35MB/145W) FIO Processor Kit	793032-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2637v3 (3.5GHz/4-core/15MB/135W) FIO Processor Kit	793034-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2643v3 (3.4GHz/6-core/20MB/135W) FIO Processor Kit	793036-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2667v3 (3.2GHz/8-core/20MB/135W) FIO Processor Kit	793038-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2683v3 (2GHz/14-core/35MB/120W) FIO Processor Kit	793046-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2650Lv3 (1.8GHz/12-core/30MB/65W) FIO Processor Kit	793050-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2698v3 (2.3GHz/16-core/40MB/135W) FIO Processor Kit	793054-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2699v3 (2.3GHz/18-core/45MB/145W) FIO Processor Kit	793056-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2603v4 (1.7GHz/6-core/15MB/85W) FIO Processor Kit	850286-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2609v4 (1.7GHz/8-core/20MB/85W) FIO Processor Kit	850288-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2620v4 (2.1GHz/8-core/20MB/85W) FIO Processor Kit	850290-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2623v4 (2.6GHz/4-core/10MB/85W) FIO Processor Kit	850292-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2630Lv4 (1.8GHz/10-core/25MB/55W) FIO Processor Kit	850294-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2630v4 (2.2GHz/10-core/20MB/85W) FIO Processor Kit	850296-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2637v4 (3.5GHz/4-core/15MB/135W) FIO Processor Kit	850298-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2640v4 (2.4GHz/10-core/25MB/90W) FIO Processor Kit	850300-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2643v4 (3.4GHz/6-core/20MB/135W) FIO Processor Kit	850302-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2650Lv4 (1.7GHz/14-core/35MB/65W) FIO Processor Kit	850304-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2650v4 (2.2GHz/12-core/30MB/105W) FIO Processor Kit	850306-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2660v4 (2.0GHz/14-core/35MB/105W) FIO Processor Kit	850308-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2667v4 (3.2GHz/8-core/25MB/135W) FIO Processor Kit	850310-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2680v4 (2.4GHz/14-core/35MB/120W) FIO Processor Kit	850314-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2683v4 (2.1GHz/16-core/40MB/120W) FIO Processor Kit	850316-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2690v4 (2.6GHz/14-core/35MB/135W) FIO Processor Kit	850318-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2695v4 (2.1GHz/18-core/45MB/120W) FIO Processor Kit	850320-L21

Configuration Information – Factory Integrated Models

HPE XL1x0r Gen9 Intel® Xeon® E5-2697v4 (2.3GHz/18-core/45MB/145W) FIO Processor Kit	850322-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2698v4 (2.2GHz/20-core/50MB/135W) FIO Processor Kit	850324-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-2699v4 (2.2GHz/22-core/55MB/145W) FIO Processor Kit	850326-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-1630v3 (3.7GHz/4-core/10MB/140W) Processor Kit	845119-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-1650v3 (3.5GHz/6-core/15MB/140W) Processor Kit	845121-L21
HPE XL1x0r Gen9 Intel® Xeon® E5-1680v3 (3.2GHz/4-core/20MB/140W) Processor Kit	845123-L21

NOTE: If two processors are desired, select one xxxxxx-L21 processor and one corresponding xxxxxx-B21. Up to two processors are supported. Mixing of processor speeds and types within the server is not supported.

NOTE: For the maximum supported memory speeds for each processor listed above, please reference the 'Memory Speed by Processor Model' table in the Memory section of the QuickSpecs.

NOTE: HT indicates that the processor model supports Intel® Hyper-Threading Technology.

NOTE: Turbo indicates the maximum potential frequency when using Intel® Turbo Boost Technology. The frequency boost increment is dependent on the processor SKU and the number of active cores. In general, a higher boost increment is obtained when fewer cores are active.

NOTE: DDR4 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.

NOTE: For the Intel® C610 Chipset E5-2600 v3 Series, the letter preceding the model number indicates the Product Line (E3, E5, E7); 2600x, 2 = number of CPUs in a Node, 6 is socket/segment designation, 00 = Processor SKU, and x = L for low power SKUs.

NOTE: All processors support Intel® Hyper-Threading and Intel® Turbo Boost Technologies except the E5-2603 v3 and E5-2609 v3.

NOTE: The letter "L" following the model number denotes lower wattage.

NOTE: The processor model as well as the memory configuration determines the maximum speed memory can operate. Please see the see the "Memory" section later in this document.

HPE Memory   **NOTE:** Minimum 2 DIMMs are required.

NOTE: HPE memory from previous generation servers (DDR3) is not compatible with this server. HPE SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen9. For additional information, please see the HPE SmartMemory QuickSpecs at: **http://www8.hpe.com/h20195/v2/GetHTML.aspx?docname=c04111535**

NOTE: LRDIMM and RDIMM are distinct memory technologies and cannot be mixed within a server.

NOTE: Depending on the memory configuration and processor model, the memory speed may run at 2133MHz, 1866MHz, or 1600MHz. Please see Memory Population Table or the Online Memory Configuration Tool at: **http://h22195.www2.hpe.com/MemoryTool/Home/Legal**

Registered DIMMs (RDIMMs) - E5-2600 v3 series Processors

HPE 4GB (1x4GB) Single Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726717-B21
HPE 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726718-B21
HPE 8GB (1x8GB) Dual Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit	759934-B21
HPE 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726719-B21
HPE 32GB (1x32GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	728629-B21

Registered DIMMs (RDIMMs) - E5-2600 v4 series Processors

HPE 8GB (1x8GB) Single Rank x8 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805347-B21
HPE 16GB (1x16GB) Single Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805349-B21
HPE 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805351-B21
HPE 16GB (1x16GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	836220-B21

Load Reduced DIMMs (LRDIMMs) - E5-2600 v3 series Processors

HPE 32GB (1x32GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726722-B21
HPE 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726720-B21

Load Reduced DIMMs (LRDIMMs) - E5-2600 v4 series Processors

HPE 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Load Reduced Memory Kit	805353-B21
HPE 64GB (1x64GB) Quad Rank x4 DDR4-2400 CAS-17-17-17 Load Reduced Memory Kit	805358-B21

Configuration Information – Factory Integrated Models

Step 3: Choose Additional Factory Integrated Options (only one from each category unless otherwise noted)

BIOS Mode	HPE Legacy FIO Mode Setting	758959-B21
	NOTE: If B140i is the only primary controller, then this option cannot be selected. When this option is selected, then BIOS need to be switched from default UEFI Mode to Legacy Mode.	
Controller State	HPE FIO Enable B140i Setting	784308-B21
	NOTE: Must be selected when B140i is used as primary controller and RAID is desired.	
	HPE Mfg FIO Enable HBA Mode Setting	792962-B21
	NOTE: When selected if H240ar/H240 are used as the primary controller then RAID is not allowed.	

Step 4: Choose Additional Options for Factory Integration from Core and Additional Options sections below.

NOTE: for additional options, please refer to "Core Options" and "Additional Options" section below.
NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, Hewlett Packard Enterprise recommends the use of an Hewlett Packard Enterprise approved configurator. Contact your local sales representative for additional information.

HPE Processors	HPE XL1x0r Gen9 Intel® Xeon® E5-2603v3 (1.6GHz/6-core/15MB/85W) Processor Kit	793012-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2609v3 (1.9GHz/6-core/15MB/85W) Processor Kit	793014-B21
	HPE XL1x0R Gen9 Intel® Xeon® E5-2620v3 (2.4GHz/6-core/15MB/85W) Processor Kit	793016-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2630v3 (2.4GHz/8-core/20MB/85W) Processor Kit	793018-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2640v3 (2.6GHz/8-core/20MB/90W) Processor Kit	793020-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2650v3 (2.3GHz/10-core/25MB/105W) Processor Kit	793022-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2660v3 (2.6GHz/10-core/25MB/105W) Processor Kit	793024-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2670v3 (2.3GHz/12-core/30MB/120W) Processor Kit	793026-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2680v3 (2.5GHz/12-core/30MB/120W) Processor Kit	793028-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2690v3 (2.6GHz/12-core/30MB/135W) Processor Kit	793030-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2697v3 (2.6GHz/14-core/35MB/145W) Processor Kit	793032-B21
	HPE XL1x0 Gen9 Intel® Xeon® E5-2695v3 (2.3GHz/14-core/35MB/120W) Processor Kit	793048-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2637v3 (3.5GHz/4-core/15MB/135W) Processor Kit	793034-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2643v3 (3.4GHz/6-core/20MB/135W) Processor Kit	793036-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2667v3 (3.2GHz/8-core/20MB/135W) Processor Kit	793038-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2683v3 (2GHz/14-core/35MB/120W) Processor Kit	793046-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2650Lv3 (1.8GHz/12-core/30MB/65W) Processor Kit	793050-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2698v3 (2.3GHz/16-core/40MB/135W) Processor Kit	793054-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2699v3 (2.3GHz/18-core/45MB/145W) Processor Kit	793056-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2609v4 (1.7GHz/8-core/20MB/85W) Processor Kit	850288-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2620v4 (2.1GHz/8-core/20MB/85W) Processor Kit	850290-B21
	HPE XL1x0r Gen9 Intel® Xeon® E5-2623v4 (2.6GHz/4-core/10MB/85W) Processor Kit	850292-B21

Configuration Information – Factory Integrated Models

HPE XL1x0r Gen9 Intel® Xeon® E5-2630Lv4 (1.8GHz/10-core/25MB/55W) Processor Kit	850294-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-2630v4 (2.2GHz/10-core/25MB/85W) Processor Kit	850296-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-2637v4 (3.5GHz/4-core/15MB/135W) Processor Kit	850298-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-2640v4 (2.4GHz/10-core/25MB/90W) Processor Kit	850300-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-2643v4 (3.4GHz/6-core/20MB/135W) Processor Kit	850302-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-2650Lv4 (1.7GHz/14-core/35MB/65W) Processor Kit	850304-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-2650v4 (2.2GHz/12-core/30MB/105W) Processor Kit	850306-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-2660v4 (2.0GHz/14-core/35MB/105W) Processor Kit	850308-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-2667v4 (3.2GHz/8-core/25MB/135W) Processor Kit	850310-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-2680v4 (2.4GHz/14-core/35MB/120W) Processor Kit	850314-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-2683v4 (2.1GHz/16-core/40MB/120W) Processor Kit	850316-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-2690v4 (2.6GHz/14-core/35MB/135W) Processor Kit	850318-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-2695v4 (2.1GHz/18-core/45MB/120W) Processor Kit	850320-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-2697v4 (2.3GHz/18-core/45MB/145W) Processor Kit	850322-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-2698v4 (2.2GHz/20-core/50MB/135W) Processor Kit	850324-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-2699v4 (2.2GHz/22-core/55MB/145W) Processor Kit	850326-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-1630v3 (3.7GHz/4-core/10MB/140W) Processor Kit	845119-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-1650v3 (3.5GHz/6-core/15MB/140W) Processor Kit	845121-B21
HPE XL1x0r Gen9 Intel® Xeon® E5-1680v3 (3.2GHz/4-core/20MB/140W) Processor Kit	845123-B21

NOTE: For 845119-B21, 845121-B21, and 845123-B21 installed in XL190r gen9, to prevent potential performance drop (CPU throttling), the max. working temperature should be under 23°C ambient temperature.

HPE Memory

Registered DIMMs (RDIMMs) - E5-2600 v3 series Processors

HPE 4GB (1x4GB) Single Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726717-B21
HPE 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726718-B21
HPE 8GB (1x8GB) Dual Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit	759934-B21
HPE 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726719-B21
HPE 32GB (1x32GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	728629-B21

Load Reduced DIMMs (LRDIMMs) - E5-2600 v3 series Processors

HPE 32GB (1x32GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726722-B21
HPE 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726720-B21

M.2

HPE XL170r/190r NGFF Riser for M2SATA Kit	798190-B21
HPE XL1x0r Gen9 New Generation Form Factor 240GB (2x120GB) Riser Drive	844540-B21

HPE Hard Drives

Hot Plug SFF Drives
NOTE: User may select any combination of SAS or SATA Hard Drives.
However, if RAID is selected and both SAS and SATA Hard Drives have been selected, then only the SAS Drives will be used in the RAID set.
NOTE: If B140i is the primary controller, user can only select SATA drives.

Configuration Information – Factory Integrated Models

NOTE: Can't select HDD when customers oder standalone XL1x0 node without r2x00 enclosure

HPE 3.84TB 6G SATA Read Intensive-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816929-B21
HPE 3.84TB 6G SATA Read Intensive-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816929-B21
HPE 3.84TB 6G SATA Read Intensive-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816929-B21
HPE 480GB 6G SATA Mixed Use-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816985-B21
HPE 960GB 6G SATA Mixed Use-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816995-B21
HPE 1.92TB 6G SATA Mixed Use-3 SFF 2.5-in SC 3yr Wty Solid State Drive	817011-B21
HPE 80GB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804575-B21
HPE 120GB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804581-B21
HPE 240GB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804587-B21
HPE 480GB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804593-B21
HPE 800GB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804599-B21
HPE 1.6TB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804605-B21
HPE 200GB 6G SATA Mixed Use-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804613-B21
HPE 800GB 6G SATA Mixed Use-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804625-B21
HPE 1.6TB 12G SAS Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	762263-B21
HPE 1.6TB 6G SATA Mixed Use-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804631-B21
HPE 480GB 6G SATA Mixed Use-2 LFF 3.5-in SCC 3yr Wty Solid State Drive	832417-B21
HPE 200GB 6G SATA Write Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804639-B21
HPE 400GB 6G SATA Write Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804665-B21
HPE 800GB 6G SATA Write Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804671-B21
HPE 450GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	759210-B21
HPE 1.2TB 6G SATA Write Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804677-B21
HPE 1.6TB 12G SAS Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	762263-B21
HPE 800GB 12G SAS Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	762261-B21
HPE 600GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	759212-B21
HPE 450GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	759210-B21
HPE 300GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	759208-B21
HPE 3.2TB 12G SAS Mixed Use-3 SFF 2.5-in SC 3yr Wty Solid State Drive	822567-B21
HPE Small Form Factor Hard Drive Blank Kit	666987-

Configuration Information – Factory Integrated Models

	B21
HPE 1.2TB 6G SAS 10K rpm SFF (2.5-inch) SC Dual Port Enterprise 3yr Warranty Hard Drive	718162-B21
HPE 600GB 10k SAS 2.5 SC SGT Special Drive	702284-B21
HPE 400GB 6G SAS Light Endurance SFF 2.5-in SC Enterprise Light 3yr Wty Solid State Drive	767904-B21
HPE 960GB 6G SATA Light Endurance SFF 2.5-in SC Enterprise Light 3yr Wty G1 Solid State Drive	756601-B21
HPE 480GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive	756657-B21
HPE 240GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive	756636-B21
HPE 120GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty G1 Solid State Drive	756621-B21
HPE 240GB 6G SATA Read Intensive SFF 2.5-in SC 3yr Wty Solid State Drive	789135-B21
HPE 960GB 6G SATA Light Endurance SFF 2.5-in SC Enterprise Light 3yr Wty G1 Solid State Drive	756601-B21
HPE 300GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652611-B21
HPE 1TB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	652749-B21
HPE 1TB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655710-B21
HPE 900GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652589-B21
HPE 600GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652583-B21
HPE 500GB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	652745-B21
HPE 500GB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655708-B21
HPE 450GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652572-B21
HPE 300GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652564-B21
HPE 146GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652605-B21

Hot Plug LFF

NOTE: User may select any combination of SAS or SATA Hard Drives.
However, if RAID is selected and both SAS and SATA Hard Drives have been selected, then only the SAS Drives will be used in the RAID set.
NOTE: If B140i is the primary controller, user can only select SATA drives.
NOTE : Can't select HDD when customers oder standalone XL1x0 node without r2x00 enclosure

HPE Gen9 LFF HDD Spade Blank Kit	807878-B21
HPE 1.6TB 12G SAS Value Endurance LFF 3.5-in LPC Enterprise Performance 3yr Wty Solid State Drive	797301-B21
HPE 800GB 12G SAS Mainstream Endurance LFF 3.5-in LP Enterprise Midline 3yr Wty Solid State Drive	797291-B21
HPE 800GB 12G SAS Value Endurance LFF 3.5-in LPC Enterprise Performance 3yr Wty Solid State Drive	797299-B21

Configuration Information – Factory Integrated Models

HPE 400GB 12G SAS Mainstream Endurance LFF 3.5-in LPC Enterprise Midline 3yr Wty Solid State Drive	797289-B21
HPE 600GB 12G SAS 15K rpm LFF (3.5-inch) Low Profile C Enterprise 3yr Warranty Hard Drive	797283-B21
HPE 450GB 12G SAS 15K rpm LFF (3.5-inch) Low Profile C Enterprise 3yr Warranty Hard Drive	797287-B21
HPE 300GB 12G SAS 15K rpm LFF (3.5-inch) Low Profile C Enterprise 3yr Warranty Hard Drive	797285-B21
HPE 960GB 6G SATA Light Endurance LFF 3.5-in LPC Enterprise Light 3yr Wty Solid State Drive	797305-B21
HPE 480GB 6G SATA Value Endurance LFF 3.5-in LPC Enterprise Value 3yr Wty Solid State Drive	797303-B21
HPE 960GB 6G SATA Mixed Use-3 LFF 3.5-in LPC 3yr Wty Solid State Drive	832433-B21
HPE 480GB 6G SATA Read Intensive-2 LFF 3.5-in LPC 3yr Wty Solid State Drive	840987-B21
HPE 800GB 6G SATA Read Intensive-2 LFF 3.5-in LPC 3yr Wty Solid State Drive	840990-B21
HPE 1.6TB 6G SATA Read Intensive-2 LFF 3.5-in LPC 3yr Wty Solid State Drive	840993-B21
HPE 4TB 6G SATA 7.2K rpm LFF (3.5-inch) 512e Low Profile Midline 1yr Warranty Hard Drive	846783-B21
HPE 6TB 6G SATA 7.2K rpm LFF (3.5-inch) 512e Low Profile Midline 1yr Warranty Hard Drive	846785-B21
HPE 1.6TB 6G SATA Mixed Use-2 LFF 3.5-in LPC 3yr Wty Solid State Drive	846788-B21
HPE 4TB 12G SAS 7.2K rpm LFF (3.5-inch) 512e Low Profile Midline 1yr Warranty Hard Drive	846996-B21
HPE 6TB 12G SAS 7.2K rpm LFF (3.5-inch) 512e Low Profile Midline 1yr Warranty Hard Drive	846998-B21
HPE 8TB 6G SATA 7.2K rpm LFF (3.5in) 512e LP Midline 1yr Warranty Hard Drive	834028-B21
HPE 8TB 12G SAS 7.2K rpm LFF (3.5in) 512e LP Midline 1yr Warranty Hard Drive	834031-B21
HPE 6TB 6G SAS 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive	797263-B21
HPE 4TB 6G SAS 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive	797267-B21
HPE 3TB 6G SAS 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive	797277-B21
HPE 2TB 6G SAS 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive	797279-B21
HPE 1TB 6G SAS 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive	797281-B21
HPE 6TB 6G SATA 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive	797269-B21
HPE 4TB 6G SATA 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive	797265-B21
HPE 3TB 6G SATA 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive	797271-B21
HPE 2TB 6G SATA 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive	797273-B21
HPE 1TB 6G SATA 7.2K rpm LFF (3.5-inch) Low Profile Midline 1yr Warranty Hard Drive	797275-B21

HPE Networking **Ethernet Options**

FlexibleLOM Adapters

HPE Ethernet 10Gb 2-port 562SFP+ Adapter	727055-B21
HPE Ethernet 10Gb 2-port 562FLR-SFP+ Adapter	727054-B21
HPE Ethernet 1Gb 4-port 331FLR Adapter	629135-B21

Configuration Information – Factory Integrated Models

HPE Ethernet 1Gb 4-port 366FLR Adapter	665240-B21
HPE Ethernet 10Gb 2-port 560FLR-SFP+ Adapter	665243-B21
HPE FlexFabric 10Gb 4-port 536FLR-T Adapter	764302-B21
HPE FlexFabric 10Gb 2-port 556FLR-T Adapter	794525-B21
HPE FlexFabric 10Gb 2-port 534FLR-SFP+ Adapter	700751-B21
HPE FlexFabric 10Gb 2-port 533FLR-T Adapter	700759-B21
HPE FlexFabric 10Gb 2-port 556FLR-SFP+ Adapter	727060-B21
HPE Ethernet 10Gb 2-port 546FLR-SFP+ Adapter	779799-B21
HPE StoreFabric CN1200E 10GBASE-T Dual Port Converged Network Adapter	N3U51A
HPE StoreFabric CN1100R 10GBASE-T Dual Port Converged Network Adapter	N3U52A
InfiniBand Options	
QLogic InfiniBand 4X QDR PCI-E G2 Dual Port HCA	583211-B21
HPE InfiniBand FDR 2-port 545QSFP Adapter	702211-B21
HPE InfiniBand FDR/Ethernet 10Gb/40Gb 2-port 544+QSFP Adapter	764284-B21
HPE InfiniBand FDR 2-port 545FLR-QSFP Adapter	702212-B21
HPE InfiniBand FDR/Ethernet 10Gb/40Gb 2-port 544+FLR-QSFP Adapter	764285-B21
HPE InfiniBand QDR/Ethernet 10Gb 2-port 544+FLR-QSFP Adapter	764286-B21
HPE 100Gb 1-port OP101 QSFP28 x16 PCIe Gen3 with Intel® Omni-Path Architecture Adapter	829335-B21
HPE XL170r/190r Low Profile PCI-E x16 Left Riser Kit	798178-B21
HPE XL190r Low Profile x16 FlexibleLOM x8 Right Riser Kit	798184-B21
HPE XL190r Gen9 GPU Direct Attach Re-timer Right Riser Kit	827353-B21
HPE XL190r x16x16x16 11OS Right Riser Kit	798186-B21
HPE XL190r x16x16x16 Graphics Processing Unit Direct Right Riser Kit	798188-B21
HPE XL190r Gen9 2x3 Dual Graphics Processing Unit Adapter Kit	798196-B21
HPE XL190r Gen9 2x3 2x4 Single Graphics Processing Unit Adapter Kit	798203-B21
HPE XL190r Low Profile PCIex16 Left Riser Kit	800293-B21
HPE XL190r Single K80 GPU Adapter Kit	802852-B21
HPE XL190r Gen9 Dual K80/M60 Graphics Processing Unit Adapter Kit	802855-B21
HPE XL190r Gen9 Enhanced 11OS Right Riser Kit	852767-B21
HPE XL190r Gen9 Enhanced GD Right Riser Kit	852769-B21

Graphic Card Options

HPE XL190r Intel® GPU Enablement Cable Kit	800809-B21
HPE XL190r K40 Enablement Cable Kit	800807-B21
HPE NVIDIA GRID K2 Reverse Air Flow GPU PCIe FIO Enablement Kit	842509-B21
HPE XL190r Gen9 AMD GPU Enablement Kit	827357-B21
HPE NVIDIA Quadro K4200 Graphics Accelerator	J0G90A
NVIDIA Tesla K40 12 GB Computational Accelerator	F1R08A
HPE NVIDIA Tesla K80 Dual GPU PCIe Computational Accelerator	J0G95A

Configuration Information – Factory Integrated Models

PE AMD S9150 Accelerator Kit   JoH11A

NOTE: the following table summaries the configuration options for risers associated with the GPU cards.

	HPE NVIDIA Quadro K4200 PCIe Graphics Adptr	HPE NVIDIA Tesla K80 Dual GPU Module	HPE Intel Xeon Phi 5110P Coprocessor Kit	HPE NVIDIA Tesla K40 12 GB Module	HPE AMD S9150 Accelerator Kit	HPE NVIDIA GRID K2-RAF PCIe GPU Kit	HPE NVIDIA Grid M60-RAF Dual GPU Module
	J0G90A	J0G95A	C1P87A	F1R08A	J0H11A	753958-B21	M3X67A
HPE XL190r Gen9 NVIDIA K2 RAF Enable Kit (842509-B21)						x	
HPE XL190r Gen9 AMD GPU Enablement Kit (827357-B21)					x		
HPE XL190r Gen9 Intel GPU Enablement Kit (800809-B21)			x				
HPE XL190r Gen9 K40 Enablement Kit (800807-B21)		X		X			X
HPE XL190r Gen9 Dul K80/M60 GPU Adptr Kit (802855-B21)		X					X
HPE XL190r Gen9 Single GPU Adptr Kit (798203-B21)	X		X	X	X		
HPE XL190r Gen9 Dual GPU Adptr Kit (798196-B21)			X	X	X	X	
HPE FLOM 2U node Riser (798184-B21)	X		X	X	X		
HPE 11OS Riser kit (198184-B21)			X	X		X	
HPE GD Riser kit (798188-B21)			X	X		X	

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://www8.hp.com/h20195/v2/gethtml.aspx?docname=c04168349

HPE Rack Options   HPE USB BFR with PVC Free Keyboard/Mouse Kit

HPE USB BFR with PVC Free US Keyboard/Mouse Kit   631341-B21

Configuration Information – Factory Integrated Models

	HPE Trusted Platform Module 2.0 Kit	745823-B21
HPE Insight Software	**Integrated Lights-Out (iLO)**	
	HPE iLO Scale Out	
	HPE iLO Advanced including 1yr 24x7 Technical Support and Updates E-LTU	E6U59ABE
	HPE iLO Advanced including 3yr 24x7 Technical Support and Updates E-LTU	E6U64ABE
	HPE iLO Scale-Out including 3yr 24x7 Tech Support and Updates Flex Qty E-LTU	BD776AAE
	HPE iLO Scale-Out including 3yr 24x7 Tech Support and Updates Tracking LTU	BD777A
	HPE iLO Scale-Out including 3yr 24x7 Tech Support and Updates Tracking LTU	BD777A
	HPE iLO Scale-Out 1yr 24x7 Tech Support and Updates Flexible Quantity LTU	BD778A
	HPE Integrated Lights-Out (iLO) Advanced for ProLiant	
	HPE iLO Scale-Out including 1yr 24x7 Tech Support and Updates Flex Qty E-LTU	BD778AAE
	HPE iLO Scale-Out including 1yr 24x7 Tech Support and Updates Tracking LTU	BD779A
	HPE iLO Advanced including 3yr 24x7 Tech Support and Updates 1-server LTU	BD505A
	HPE iLO Advanced including 3yr 24x7 Tech Support and Updates Flexible Quantity LTU	BD506A
	HPE iLO Advanced Electronic License with 3yr 24x7 Tech Support and Updates	BD506AAE
	HPE iLO Advanced including 3yr 24x7 Tech Support and Updates Tracking LTU	BD507A
	HPE iLO Advanced including 1yr 24x7 Technical Support and Updates 1-server LTU	512485-B21
	HPE iLO Advanced including 1yr 24x7 Technical Support and Updates Flexible Quantity LTU	512486-B21
	HPE iLO Advanced including 1yr 24x7 Technical Support and Updates Tracking LTU	512487-B21
	HPE iLO Advanced including 1yr 24x7 Technical Support and Updates Electronic License	TA850AAE

NOTE: For additional license options please see the QuickSpecs at:
https://www.hpe.com/h20195/v2/gethtml.aspx?docname=c04154343

NOTE: For more information, visit: **http://www.hp.com/go/ilo**

HPE Memory

For detailed memory configuration rules and guidelines, please use the Online DDR4 Memory Configuration Tool:
http://h22195.www2.hpe.com/MemoryTool/Home/Legal
Memory Subsystem Architecture
Each Intel® Xeon® E5-2600 v3 family processor socket contains four memory channels that support two DIMMs each for a total of eight (8) DIMM per installed processor or a grand total of sixteen (16) DIMMs for the server. Up to 32GB capacity DIMMs are supported for 512GB of memory (16 DIMM slots x 32GB per DIMM).

Configuration Information – Factory Integrated Models

Memory Population Rules and Guidelines:

- White DIMM slots denote the first slot of a channel. For 1 DPC (DIMM per channel) populate white slots only.
- Install DIMMs only if the corresponding processor is installed.
- There are two channels per processor with two DIMM slots per channel.
- Memory channel A consists of the two (2) DIMMs that are closest to the processor.
- Memory channel B consists of the two (2) DIMMs that are furthest from the processor.
- Populate DIMMs from heaviest load (quad-rank) to lightest load (single-rank) within a channel
- Heaviest load (DIMM with most ranks) within a channel goes furthest from the processor
- No support for RDIMMs; Non-ECC UDIMMs
- DIMMs of different speeds may be mixed in any order; the server will select a common optimal speed.
- The maximum memory speed is a function of the memory type, memory configuration, and processor model.
- The maximum memory capacity is a function of the memory type and number of installed processors.
- To realize the performance memory capabilities listed in this document, HPE SmartMemory is required. For additional information, please see the HPE SmartMemory QuickSpecs at:
- **https://www.hpe.com/h20195/v2/gethtml.aspx?docname=c04111535**
- For memory population rules and additional memory guidelines, please see the HPE ProLiant XL230 Gen9 user guide at **http://www.hpe.com/support**

Supported Memory Bandwidth on Intel® Xeon® E5-2600 v3 series Processors

DIMM Rank	Register DIMM (RDIMM)		Load Reduced (LRDIMMs)
	Single Rank (1R)	Dual Rank (2R)	Quad Rank (4R)
DIMM Capacity	8GB	16GB	32GB
Voltage	Std Voltage 1.2V	Std Voltage 1.2V	Std Voltage 1.2V
SLOTS THAT CAN BE POPULATED			
16 slots	16	16	16
MAXIMUM CAPACITY (GB)*			
16 slots	128	256	512
POPULATED DIMM SPEED (MT/s)			
1 DIMM Per Channel	2133	2133	2133
2 DIMM Per Channel	2133	2133	2133
*Maximum Capacity will vary based on individual serve platform qualification schedule			

Supported Memory Bandwidth on Intel® Xeon® E5-2600 v4 series Processors

DIMM Rank	Register DIMM (RDIMM)		Load Reduced (LRDIMMs)
	Single Rank (1R)	Dual Rank (2R)	Quad Rank (4R)
DIMM Capacity	16GB	32GB	32GB
Voltage	Std Voltage 1.2V	Std Voltage 1.2V	Std Voltage 1.2V
SLOTS THAT CAN BE POPULATED			
16 slots	16	16	16
MAXIMUM CAPACITY (GB)*			
16 slots	256	512	512
POPULATED DIMM SPEED (MT/s)			

Configuration Information – Factory Integrated Models

| 1 DIMM Per Channel	2400	2400	2400
2 DIMM Per Channel	2133	2133	2133
*Maximum Capacity will vary based on individual serve platform qualification schedule			

Memory Speed by E5-2600 v3 Series Processor Model

Processor Models (please based on processor model Mission Bay offer to update below SKUs)	Supported Memory Speeds
E5-2690 v3, E5-2695 v3, E5-2697 v3, E5-2698 v3, E5-2699 v3, E5-2687W v3, E5-2683 v3, E5-2680 v3, E5-2670 v3, E5-2667 v3 , E5-2660 v3, E5-2650 v3, E5-2650L, E5-2643 v3, E5-2637 v3	2133MHz
E5-2640 v3, E5-2630 v3, E5-2630L v3, E5-2623 v3, E5-2620 v3	1866MHz
E5-2609 v3, E5-2603 v3	1600MHz

Memory Speed by E5-2600 v4 Series Processor Model

Processor Models (please based on processor model Mission Bay offer to update below SKUs)	Supported Memory Speeds
E5-2643 v4, E5-2650Lv4, E5-2650 v4, E5-2660 v4, E5-2667 v4, E5-2680 v4, E5-2683 v4, E5-2690 v4, E5-2695 v4 , E5-2697 v4, E5-2698 v4, E5-2699v4, E5-2637 v4.	2400MHz
E5-2620 v4, E5-2623 v4, E5-2630L v4, E5-2630 v4, E5-2637 v4, E5-2640 v4	2133MHz
E5-2603 v4, E5-2609 v4	1866MHz

Supported Memory Bandwidth on Intel® Xeon® E5-2600 v4 series Processors

NOTE: Capacity references are rounded to the common gigabyte (GB) values.

- 2GB = 2,048MB
- 4GB = 4,096MB
- 8GB = 8,192MB
- 16GB = 16,384MB
- 32GB = 32,768MB

Memory options part number decoder
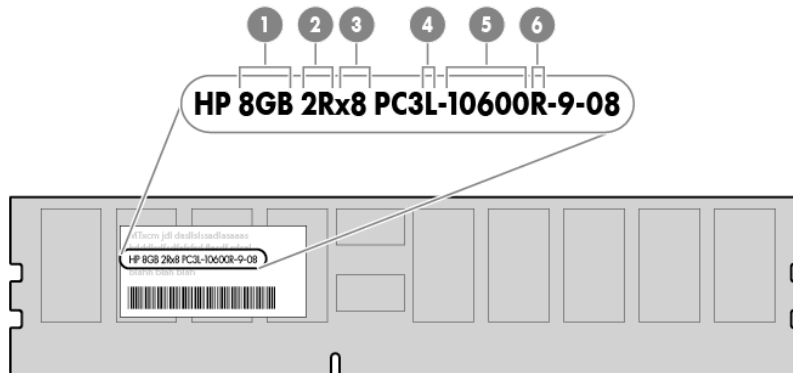
Configuration Information – Factory Integrated Models

Item	Description	Definition
1	Capacity	8 GByte / 16 GByte / 32 GByte
2	Rank	1R=Single-rank / 2R = Dual-rank / 4R Quad-rank
3	Data Width	x4 = 4-bit / x8 =-bit
4	Memory Generation	DDR4
5	Max. Memory Speed	2133MT/s
6	CasLatency	P=15
6	DIMM type	R= RDIMM (registered)
		L= LRDIMM (registered)

Technical Specifications

System Unit	Server Dimensions (L x W x D)	1.63 x 7.07 x 25.26 in (4.13 x 17.95 x 64.15 cm)
	Weight (approximate)	Maximum (four hard drives and two processors installed) — 14.27 lb (6.47 kg)
	System Inlet Temperature — Standard Operating Support	System performance during standard operating support may be reduced if operating with a fan fault or above 30°C (86°F). For approved hardware configurations, the supported system inlet range is extended to be: 5° to 10°C (41° to 50°F) and 35° to 40°C (95° to 104°F) at sea level with an altitude derating of 1.0°C per every 175 m (1.8°F per every 574 ft) above 900 m (2953 ft) to a maximum of 3050 m (10,000 ft). The approved hardware configurations for this system are listed at the URL:
	Extended Ambient Operating Support	**http://www.hp.com/servers/ASHRAE** For approved hardware configurations, the supported system inlet range is extended to be: 40° to 45°C (104° to 113°F) at sea level with an altitude derating of 1.0°C per every 125 m (1.8°F per every 410 ft) above 900 m (2953 ft) to a maximum of 3050 m (10,000 ft). The approved hardware configurations for this system are listed at the URL: **http://www.hp.com/servers/ASHRAE** System performance may be reduced if operating in the extended ambient operating range or with a fan fault.
	Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
	Relative Humidity (non-condensing) — Operating	Minimum to be the higher (more moisture) of -12°C (10.4°F) dew point or 8% relative humidity. Maximum to be the lower (less moisture) of 24°C (75.2°F) dew point or 90% relative humidity.
	Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
	Altitude — Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWAd) and measured average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). The listed sound levels apply to standard shipping configurations. Additional options may result in increased sound levels.
	Emissions Classification (EMC) — FCC Rating	Class A
	Normative Standards	CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN

Technical Specifications

61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1

NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

Acoustic Noise

SL2000 Gen 9 Configuration				
Configuration	**Entry**	**Typical**	**Performance**	**Others**
CPU type and qty	HPE XL1x0r Gen9 ZE5-2630v3 Kit x 1	HPE XL1x0r Gen9 ZE5-2630v3 Kit x1	HPE XL1x0r Gen9 ZE5-2630v3 Kit x2	NA
DIMM type, capacity and qty	HPE Z16GB 2Rx4 PC4-2133P-R Kit x2	HPE Z16GB 2Rx4 PC4-2133P-R Kit x2	HPE Z16GB 2Rx4 PC4-2133P-R Kit x4	NA
HDD type and qty	500GB 6G SATA 7.2K SFF HDD x2	HPE 450GB 12G SAS 15K 2.5in x2	HPE 450GB 12G SAS 15K 2.5in x2	NA
HDD Backplane	24SFF W/O Expander	24SFF W/ Expander	24SFF W/ Expander	NA
HD Controller for flexible storage options	B140i onboard SATA	HPE Smart Array P440/4GB 12Gb Controller	HPE Smart Array P440/4GB 12Gb Controller	NA
LOM for flexibility for multiple ALOM/BLOM	NA	NA	NA	NA
Fan type and count	8038mm x4	8038mm x4	8038mm x4	NA
I/O and Others (Mezz, GPGPU, NIC and etc.)	NA	NA	NA	NA
Cooling Mode Setting	Optimal Cooling	Optimal Cooling	Optimal Cooling	NA
Acoustics Performance				
Sound Power Level in Bels LWAd	Idle:6.6Bel OP: 6.6Bel	Idle:6.9 Bel OP: 6.9Bel	Idle:6.9;Bel OP: 7.1Bel	NA
Sound Pressure Level LpAm	Idle:47 dBA OP:47 dBA	Idle:50 dBA OP:50 dBA	Idle:50 dBA OP: 51 dBA	NA

NOTE: The product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 and declared in accordance with ISO 9296. The listed sound levels apply to listed configurations. Additional options may result in increased sound levels. Please have your HPE Rep refer to EMESC Website for further technical details regarding the configurations listed above.

NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

Environment-friendly Products and Approach

Hewlett Packard Enterprise offers end-of-life Hewlett Packard Enterprise product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: **http://www.hp.com/go/green** to recycle your product, please go to: **http://www.hp.com/go/green** or contact your nearest Hewlett Packard Enterprise sales office. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard Enterprise web site at: **http://www.hp.com/go/green** These

Technical Specifications

instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

Summary of Changes

Date	Version History	Action	Description of Change
4-Nov-2016	From version 10 to 11	Updated	Remove some HDD SKUs
15-Aug-2016	From version 9 to |0	Updated	Update the configuration and information section.
15-Jul-2016	From version 8 to 9	Updated	Update configuration and information sections
2-May-2016	From version 7 to 8	Updated	Added GPU and HDD throughout the QuickSpecs
31-Mar-2016	From version 6 to 7	Updated	Update configuration and information sections
16-Feb-2016	From version 5 to 6	Updated	Update the SATA, SDD and processors section
8-Jun-2015	From version 4 to 5	Changed	Chenge the errors on the document and update the configuration section.
1-Dec-2015	From version 3 to 4	Updated	Modified GOU and changes troughout the QuickSpecs
28-Sept-2015	From version 2 to 3	Updated	Added GPU and HDD throughout the QuickSpecs
17-Aug-2015	From version 1 to 2	Modified	Modified Riser card and updates throughout the QuickSpecs
30-Mar-2015	Version 1	Created	Create QuickSpecs for HPE ProLiant XL190r Gen9 Server

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